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Mark Rowlands, *The New Science of the Mind: From Extended Mind to Embodied Phenomenology*. MIT Press, Bradford Books, 2010, 249 pages, ISBN 978-0-262-01455-7, £20.24.

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Andy Clark once remarked that we make the world smart so we don't have to be (Clark, 1997). What he meant was that human beings (along with many other animals) alter and transform their environments in

order to accomplish certain tasks that would prove difficult (or indeed impossible) without such transformations. This remarkable insight goes a long way towards explaining many aspects of human culture, ranging from linguistic notational systems to how we structure our cities. It also provides the basis for Mark Rowlands' thought-provoking and insightful book, *The New Science of the Mind*.

Rowlands' aim with this book is to show why we should reject Cartesian cognitive science, that is, why we should reject a cognitive science that assumes that mental states and cognitive processes are solely realized by neural mechanisms in the brain. For Rowlands, processes outside the brain can form genuine parts of our minds. That is, the manipulation and transformation of our bodies and environments can constitute real parts of (some of) our mental states and cognitive processes.

Yet this raises a question. Why should we think that processes outside the brain are real parts of our cognizing rather than just merely causally important for that cognizing? Rowlands answers this with his mark of the cognitive. He claims that when processes outside the brain conform to a mark of the cognitive, then they can become real parts of the

cognitive processing of a subject (p110-111). According to Rowlands, non-Cartesian cognitive science - that is, a cognitive science that rejects the assumption that mental states and cognitive processes are solely realized by neural mechanisms in the brain - requires a mark of the cognitive.

This claim places Rowlands at odds both with those who deny the possibility of such a science and those who champion it. For example, Adams and Aizawa (2001; 2010) have argued that only internal states and processes qualify as cognitive because only internal states and processes trade in intrinsic contents. They then claim that if trading in intrinsic contents is a mark of the cognitive, then bodily or environmental processes do not have the mark since they do not trade in such contents and consequently such processes cannot be regarded as cognitive or as playing constitutive roles in the cognition of subjects. Conversely, Andy Clark (2010) thinks that objects and processes in the environment can be regarded as truly cognitive but argues that you do not require a mark of the cognitive in order to make this claim. Thus, Rowlands' insistence on a mark of the cognitive is a key distinguishing

feature of his position in the debate over non-Cartesian cognitive science.

This review will have three explanatory aims. First, it will outline why Rowlands thinks a mark of the cognitive is needed for non-Cartesian cognitive science. Second, it will sketch out what is Rowlands' mark of the cognitive. Third, it will identify some of the possible strengths and weaknesses of Rowlands' approach to such a science.

Over recent years, non-Cartesian approaches to cognitive science have often been labeled 4e. This refers to the overlapping but importantly distinct claims that mental states and cognitive processes are variously *embodied*, *embedded*, *enacted* and/or *extended* (hence 4e). Briefly, mental states and cognitive processes are *embodied* when they are partly constituted by bodily processes; they are *embedded* when there is an essential causal dependence between such states and processes and the environment; they are *enacted* when the actions of the subject can partly constitute these states and processes; and they are *extended* when objects or processes in the environment can partly constitute those states and processes.

In comparing and contrasting all four approaches, Rowlands argues that only embodied and extended mind are needed to demonstrate what he calls Amalgamated Mind. This is the idea that “[c]ognitive processes [can be] an *amalgam* of neural structures and processes, bodily structures and processes, and environmental structures and processes” (p83, emphasis in original). Rowlands thus rejects embedded and enacted mind as needed to establish his Amalgamated Mind. However, his rejection of embedded mind is of particular significance.

Rowlands argues that embedded mind operates “as a sort of Cartesian fifth column” (p6) within 4e. By this he means that embedded mind acknowledges the force of non-Cartesian arguments while denying that such arguments prove that mind and cognition are anything other than brain processes. This is because embedded mind only demonstrates that the environment *causally contributes* to mental states and cognitive processes. It does not demonstrate that the environment partly *constitutes* those states and processes. This allows embedded mind to acknowledge the important (perhaps crucial) role the environment can play in mental activity while still denying that the processes that constitute such activity are anything other than internal to the subject.

This is why Rowlands refers to embedded mind as a “neo-Cartesian fallback position” (p70) and hence why he argues that embedded mind must be excluded from non-Cartesian cognitive science.

But how to do this? One way – maybe the only way – is to show that processes outside the brain can play a cognitive (and not merely causal) role in cognitive processing (p22). This is the strategy Rowlands pursues with his mark of the cognitive. The basic idea is that if bodily and/or environmental processes fulfill a set of conditions set out in a mark of the cognitive, then such processes will qualify as playing a cognitive role and hence can be understood to be real parts – constitutive parts – of the cognitive processing of the subject. If Rowlands is correct, then non-Cartesian cognitive science needs a mark of the cognitive if it is to refute embedded mind and thereby establish its non-Cartesian credentials.

Understanding why Rowlands reaches this conclusion becomes clearer when we contrast his position with that of Clark. Clark (2010) denies that non-Cartesian cognitive science needs a mark of the cognitive on the grounds that parts of an extended brain-body-world system need not display properties exhibited by the system as a whole. That is, even

if “body” and “world” parts of such a system do not display characteristics we traditionally associate with cognition, this should not exclude such parts from playing a potentially constitutive role in the cognitive routines performed by the extended system.

Rowlands’ objection to this is that such a position remains vulnerable to embedded mind. This is because if there are no requirements that the parts of the system all exhibit similar properties, then it is unclear that all parts of the system are playing cognitive (and not merely causal) roles within the system (pp86-93). Moreover, following Adams and Aizawa (2001), Rowlands rejects appeals to “precise coupling” by claiming that coupling is not sufficient to show constitution. Hence, Clark fails to show that the “body” and “world” parts of the brain-body-world system are playing cognitive and so constitutive roles in the cognitive routines of the extended system.

Into this breach steps the mark of the cognitive. For Rowlands, only a mark of the cognitive can demonstrate that bodily and/or environmental processes are all playing cognitive roles and hence only a mark of the cognitive can show why such processes partly constitute (and not merely

cause) the cognitive routines of subjects. This is why, according to Rowlands, only a mark of the cognitive can demonstrate non-Cartesian cognitive science.

Rowlands' mark of the cognitive consists of four inter-related conditions that if fulfilled qualify a process (whether internal or external) as cognitive (p110-111). The first condition is that a process must involve the manipulation and transformation of information-bearing structures. The second condition is that the manipulation and transformation of such structures must have the proper function of making new information available to the subject or to processing operations within the subject. The third condition is that this new information must be made available via a representational state in the subject. The fourth condition is that the process must be owned by the subject.

Rowlands bases his criterion on cognitive scientific practice. That is, he claims that his criterion is based on judgments made by cognitive scientists as to what counts as a cognitive process (p110). The purpose of this strategy seems to be twofold. First, it is to protect his fledging new science against the charge that it has no basis in the day-to-day work

of actual science. As Rowlands makes clear (for example, with David Marr's theory of vision, pp120-121), his mark is entirely compatible with traditional cognitive science. Second, it is show that his mark of the cognitive "has conservative origins – origins that even the most dyed-in-the-wool defender of tradition would have to accept – but radical consequences" (p114). That is, his Amalgamated Mind is the logical consequence of concepts already pursued in cognitive science.

However, it is the fourth condition of Rowlands' mark of the cognitive that is arguably the most important condition of his criterion. This is because, according to Rowlands, both embodied and extended mind (and hence Amalgamated Mind) "are straightforward implications of our ownership of cognitive processes, when this is properly understood" (p150).

Rowlands addresses this issue of ownership with his analysis of intentionality, that is, with his analysis of the structure of intentional experience. He argues that on the standard model of intentionality, the concept of mode of presentation has two possible meanings (p185). First, there is the empirical mode of presentation. This refers to the

contents of experience. So, for example, when we experience the shininess or redness of a tomato, this is to experience the tomato under an empirical mode of presentation. Second, there is the transcendental mode of presentation. This refers to the *conditions that make possible or in virtue of which* an object is presented to us. That is, the transcendental mode of presentation is that “in virtue of which the tomato, or relevant part of the world, is *disclosed or revealed* to me as shiny and red” (p186, emphasis in original). Thus, the transcendental mode of presentation refers to the physical processes that disclose or reveal the world to us.

Rowlands expands on this notion of disclosure or revelation with the help of Merleau-Ponty’s (1962) famous example of the blind person and their cane. On the one hand, we can think of the cane as a straightforward empirical object. That is, as an object that the blind person uses to explore their world. However, Rowlands (following Merleau-Ponty) points out that this fails to capture the experience of the blind person “from the inside” (p196). For when we investigate the blind person’s experience from the inside, we see that the cane is much more than just an object. Rather, it is part of the conditions of

possibility or in virtue of which the blind person has experience of their world. In other words, the cane is part of the physical processes that disclose or reveal the world to the blind person.

For Rowlands, this notion of disclosure or revelation “lies at the heart of the intentionality of both perception and cognition” (p191). That is, the conditions of possibility that enable perceptual experience consist in disclosing or revealing activity as do the conditions of possibility that enable cognitive processing. This then provides Rowlands with his account of ownership. Since disclosure or revelation is always disclosure or revelation to someone (or something), then the physical processes involved are owned because they disclose or reveal the world to the subject.

Rowlands argues that Amalgamated Mind emerges as a natural consequence of this account of ownership. This is because ownership requires intentionality and intentionality is a form of disclosing or revealing activity that “typically – not always, not necessarily, but typically – extends out from the brain through the body and out into the things we do in the world” (p187).

This then is Rowlands' mark of the cognitive. Processes that involve (1) the manipulation and transformation of information bearing structures which (2) make available new information via (3) representational states and (4) disclose or reveal the world to the subject will conform to the mark of the cognitive and so can be understood to be properly cognitive processes. Since such processes need not be confined to the head but rather can extend to include bodily and environmental processes, then this mark of the cognitive establishes embodied and extended mind (and hence Amalgamated Mind) and thus provides the conceptual foundations for a non-Cartesian cognitive science.

Rowlands makes it clear that he thinks only a mark of the cognitive can establish non-Cartesian cognitive science because only such a mark can demonstrate that bodily and/or environmental processes are playing cognitive (and not merely causal) roles. As someone with considerable sympathy for non-Cartesian approaches, I would argue that a key strength of Rowlands' project is that his criterion of cognition is based on cognitive scientific practice. This moves the debate surrounding non-Cartesian approaches forward as it has been a criticism of such

approaches that they have no basis in actual science (see Adams and Aziawa, 2001). Rowlands' mark of the cognitive shows not only why this is not the case but also why the ideas of embodied and extended mind are legitimate extensions of concepts already employed by cognitive scientists.

Rowlands' mark of the cognitive also makes an interesting contribution to the debate surrounding extended mind. Clark (2009) has made it clear that he thinks extended mind does not support claims that the material processes responsible for consciousness extend beyond the brain. However, Rowlands' mark of the cognitive seems to support the idea that claims of extended mind can support claims of consciousness extension.

For instance, Clark (2001; 2003) has argued (as have others) that the interaction between an artist and their sketchpad can form a constitutive part of the cognitive processing of the artist and hence can extend the cognition of the artist. Yet this interaction also seems consistent with Rowlands' mark of the cognitive. It involves (1) the manipulation of an information bearing structure (the sketchpad) that

(2) makes available new information (the new images and shapes on the sketchpad) via (3) representational states in the artist. The interaction is also (4) part of the bodily processes that reveal or disclose the world to the artist. If the interaction between artist and sketchpad conforms to the mark of the cognitive, then both the cognitive processing and the intentional experience of the artist are extended by the interaction and hence the consciousness of the artist can extend. I would argue then that Rowlands' mark sheds new light on the relationship between extended mind and consciousness extension. This should make his book required reading for anyone interested in the relationship between these two issues.

Yet Rowlands' mark of the cognitive is, like *Amalgamated Mind* itself, a curiously amalgamated affair. For it is meant to demonstrate both embodied mind and extended mind and, as Rowlands acknowledges (pp97-104), combining these two ideas is no easy matter. This is because embodied mind privileges the role of the body by arguing that fine-grained details of human bodies are crucially important to understanding mind and cognition. Yet extended mind, at least according to Clark (2008), argues that you can abstract away from such

bodily details in order to understand mind and cognition. Rowlands aims to bridge the gap between these ideas with condition 4 of his criterion, namely his ownership argument. But a little probing reveals that neither his ownership argument nor his mark of the cognitive delivers any reconciliation between embodied and extended mind.

The ownership argument is designed to avoid cognitive bloat (p94). Cognitive bloat is the worry that if mental states and cognitive processes can be partly realised by processes outside the head, then there could be (potentially) no limit to what counts as part of the human mind. Yet the notion of disclosing or revealing activity seems to lead directly to bloat. For if we extend this notion to include environmental processes – that is, we have ownership of environmental processes because they disclose or reveal the world to us - then this means we can potentially have ownership over any and every object we encounter in the environment. For example, when I look at the table in front of me, I have ownership of the table since it is now part of the environmental processes that disclose or reveal the world to me. Clearly, this is to expand our minds rampantly into the environment, that is, it is to endorse a form of bloat.

Rowlands could avoid this by restricting the notion of disclosing or revealing activity to just bodily processes. But then his ownership argument would leave unexplained extended mind. Or he could argue that the first three conditions of his mark of the cognitive do explain extended mind. If we then allow that the fourth condition (through the ownership argument) explains embodied mind, then his mark of the cognitive does explain both extended and embodied mind. But then it is entirely unclear how his mark of the cognitive brings about any sort of reconciliation between embodied and extended mind. In short, either his ownership argument fails to reconcile embodied and extended mind or his mark of the cognitive fails to reconcile embodied and extended mind.

One option might be for Rowlands to just cut his losses here and argue that his mark of the cognitive only demonstrates embodied mind or extended mind but not both. This would avoid the tricky issue of reconciliation while still showing the merit of using a mark of the cognitive to establish a non-Cartesian cognitive science. However, Rowlands' project is then not *"From Extended Mind to Embodied*

Phenomenology” but rather “Extended Mind *or* Embodied Phenomenology”. Either way, these brief remarks show that the issue of reconciliation between embodied and extended mind requires much further treatment than it is given in Rowlands’ book.

Overall, Rowlands’ *New Science of the Mind* makes a strong case for a non-Cartesian cognitive science. In doing so, Rowlands succeeds in showing why mechanisms in the brain should not be the only focus of concern for cognitive scientists. And although Rowlands’ book leaves a key issue unresolved, it nonetheless remains a clear call to arms for all those who think it is now time to stand down the old guard and instigate a non-Cartesian cognitive revolution.

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